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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Eugene L. Flanagan III
ST.ONGE STEWARD JOHNSON & REENS LLC
986 Bedford Street
Stamford, CT 06905-5619

EXAMINER	
LERNER, MARTIN	
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2654	22

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/318,045	Applicant(s) NEUHAUSER ET AL.
	Examiner Martin Lerner	Art Unit 2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 10 April 2003 .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1 to 18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1 to 18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 10 April 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 to 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Jensen et al. ('490)* in view of *Haartsen.*

Regarding independent claims 1, 13, and 16, *Jensen et al. ('490)* discloses a system and method for decoding code symbols in an audio signal, comprising:

"means for receiving an audio signal in which a plurality of message symbols have been incorporated so that the message symbols are inaudible when the audio signal is reproduced audibly, the plurality of message symbols being contained within a predetermined message as a plurality of code symbols" – a coding apparatus and method is provided for including codes with audio signals so that, as sound, the codes are inaudible to the human ear but can be detected reliably by decoding apparatus (column 2, lines 3 to 7); in one embodiment, the host processor generates a four state data stream, that is, a data stream in which each data unit can assume one of four distinct data states each representing a unique symbol including two synchronizing symbols termed "E" and "S" and two message information symbols "1" and "0" ("a

plurality of message symbols" "a plurality of code symbols") each of which represents a respective binary state (column 10, lines 40 to 58: Figure 4);

"means for accumulating a first signal value of a first code symbol representing a predetermined message symbol and a second signal value of a second code symbol representing the same predetermined message symbol" – the apparatus accumulates data indicating the presence of code components in each of frequency bins of interest repeatedly for at least a major portion of the predetermined time frame interval in which a code symbol can be found (column 21, lines 23 to 34: Figure 11); circuit 320, under control of control circuit 314, accumulates the various code presence signals from the 4N component detector circuits 290 for a multiple number of reset cycles (column 26, lines 17 to 25: Figure 14); the output signal may be assembled into a larger message ("the same predetermined message symbol")(column 26, lines 32 to 34); control codes include parental control codes or identification numbers to prevent pirating, and consist of a plurality of message symbols (e.g. 1's and 0's) "representing the same predetermined message symbol" (column 28, line 59 to column 10, line 9; column 29, lines 44 to 51);

"means for examining the accumulated first and second signal values to detect the predetermined message symbol represented by the first and second code symbols" – once DSP 266 has accumulated such data for the relevant time frame, it then determines which of the possible code signals was present in the audio signal (column 21, lines 34 to 45: Figure 11); upon termination of the interval for detection of a given symbol, the code determination logic circuit 320 determines which code symbol was

received as that symbol for which the greatest number of components were detected during the interval and outputs a signal indicating the detected code symbol at an output terminal 322 (column 26, lines 25 to 34: Figure 14); the output signal may be assembled into a larger message ("the same predetermined message symbol")(column 26, lines 32 to 34); control codes are decoded including parental control codes or identification numbers to prevent pirating, and consisting of a plurality of message symbols (e.g. 1's and 0's) "to detect the predetermined message symbol represented by the first and second code symbols" (column 28, line 59 to column 10, line 9; column 29, lines 44 to 51).

Concerning independent claims 1, 13, and 16, the only element omitted by *Jensen et al. ('490)* is "the predetermined message symbols being represented by first and second code symbols incorporated in and displaced in time in the audio signal with at least one code symbol representing a different one of the message symbols being incorporated in the audio signal positioned in time between the first and second code symbols". *Jensen et al. ('490)* discloses message symbols represented by first and second code symbols incorporated in the audio signal, but does not displace the symbols in time, with at least one code symbol representing a different one of the message symbols being positioned in time between the first and second code symbols. Instead, *Jensen et al. ('490)* uses frequency division multiplexing of message symbols rather than time division multiplexing. However, time division multiplexing is a well known alternative to frequency division multiplexing for transmitting symbols.

Haartsen teaches an art analogous method of receiving a symbol sequence for purposes of synchronizing a transmitter and receiver in cellular telephones, where time division message symbols are accumulated and examined. A known digital sequence is divided into a number of segments S1, S2, . . . , Sn ("a plurality of message symbols", "first code symbol", "second code symbol"), where each segment has a predetermined bit pattern (column 7, lines 19 to 60: Figures 4 to 7). For a time multiplex system (TDMA) (column 1, lines 16 to 17), the segments are displaced in time, with segment S2 ("a different one of the message symbols") positioned in time between segments S1 and S3 ("the first and second code symbols") (Figures 4 to 7). *Haartsen* suggests advantages of lower power consumption and simplifying implementation with shorter digital sequences. (Column 2, Line 66 to Column 3, Line11; Column 4, Lines 21 to 39) It would have been obvious to one of ordinary skill in the art to substitute an art recognized alternative time division multiplex method of transmitting, accumulating, and examining message symbols as taught by *Haartsen* for the frequency division multiplex method disclosed by *Jensen et al. ('490)* for the purpose of simplifying implementation with shorter digital sequences and reducing power consumption.

Regarding claim 2, *Jensen et al. ('490)* discloses that for the purpose of detecting the presence and time of symbols, the sum of the values of SNR(j) ("a third signal value derived from the first and second signal values") for each possible synch symbol and data symbol is determined; it is determined whether the sum of its corresponding values SNR(j) is greater than any of the others (column 22, lines 16 to 24).

Regarding claim 3, a sum of the values of SNR(j) is a linear combination of the SNR(j) values for each of the code symbols.

Regarding claim 4, *Jensen et al. ('490)* discloses amplitude adjustment factors which serve to adjust the amplitudes of the various code frequency components; amplitudes of the relative frequency components are adjusted so that they will be masked during encoding to be inaudible to human hearing (column 13, lines 23 to 53); the adjusted amplitudes at the decoder are also non-linear functions of the original amplitudes because the amplitudes at the encoder are non-linear functions of the original amplitudes; *Jensen et al. ('490)* discloses that the signal amplitudes may be measured as an integration, root-mean-square or relative discrete value to evaluate masking ability (column 7, lines 27 to 38); at least the root-mean-square is a "non-linear function" of the original amplitude.

Regarding claim 5, *Jensen et al. ('490)* discloses that each of the symbols is representing by a unique set of code frequency components; the symbol S is represented by a first unique group of ten code frequency components f_1 through f_{10}; the symbol E is represented by a second unique group of ten code frequency components f_1 through f_{10}; the symbol 0 is represented by a further unique group of ten code frequency components f_1 through f_{10}; and the symbol 1 is represented by a further unique group of ten code frequency components f_1 through f_{10}; (column 10, line 59 to column 11, line 32: Figure 4); a noise level estimate is carried out around each frequency component bin in which a code component can occur; once the noise level for the bin of interest has been estimated, a signal-to-noise ratio for that bin SNR(j)

("component value" "characteristic of a respective frequency component") is estimated by dividing the energy level B(j) in the bin of interest by the estimated noise level NS(j)(column 20, line 43 to column 21, line 22).

Regarding claim 6, *Jensen et al. ('490)* discloses that symbol detection intervals for the decoders may be established based on the timing of synchronization symbols transmitted with each encoded message and have a predetermined order; the decoders are operative initially to search for the presence of the first anticipated synchronization symbol, that is, the encoded E symbol which is transmitted during the predetermined period and determine its transmission interval; the decoders search for the presence of code components characterizing the symbol S, and when it is detected, the decoders determine its transmission interval; from this point, the detection of each of the data bits symbols are set (column 26, lines 35 to 59); "S" and "E" are synchronization ("marker") symbols and "1" and "0" are data symbols (column 10, lines 40 to 58: Figure 4).

Regarding claim 7, *Jensen et al. ('490)* discloses a memory 270 for storing the accumulation of detected code symbols (column 21, lines 34 to 42: Figure 11), and DSP 266 decodes a symbol by examining the sum of the values of SNR(j) ("signal values") for each possible synch and data symbol (column 21, lines 46 to 59; column 22, lines 16 to 53: Figure 11).

Regarding claim 8, *Jensen et al. ('490)* discloses that a signal-to-noise ratio for each frequency bin SNR(j) ("signal value") is estimated by dividing the energy level B(j) in the bin of interest by the estimated noise level NS(j)(column 20, line 43 to column 21,

line 22); energy level B(j) and noise level NS(j) are "multiple other signal values" which are used to produce signal-to-noise ratios SNR(j) ("signal values").

Regarding claim 9, *Jensen et al. ('490)* discloses that code symbols are repeated during a characteristic time frame interval in which the encoded message has a predetermined duration and order (column 12, lines 28 to 55; column 26, lines 35 to 59: Figure 6).

Regarding claim 10, *Jensen et al. ('490)* discloses that each of the symbols is representing by a unique set of code frequency components; the symbol S is represented by a first unique group of ten code frequency components f_1 through f_{10}; the symbol E is represented by a second unique group of ten code frequency components f_1 through f_{10}; the symbol 0 is represented by a further unique group of ten code frequency components f_1 through f_{10}; and the symbol 1 is represented by a further unique group of ten code frequency components f_1 through f_{10}; (column 10, line 59 to column 11, line 32: Figure 4); a noise level estimate is carried out around each frequency component bin in which a code component can occur; once the noise level for the bin of interest has been estimated, a signal-to-noise ratio for that bin SNR(j) ("component value" "characteristic of a respective frequency component") is estimated by dividing the energy level B(j) in the bin of interest by the estimated noise level NS(j)(column 20, line 43 to column 21, line 22).

Regarding claims 11, 14 and 17, *Jensen et al. ('490)* discloses that a decoder includes an input terminal for receiving the audio signal which may be a signal picked up from a microphone ("acoustic transducer")(column 19, lines 57 to 67: Figure 11); a

digital signal processor 266 is coupled to memory 270 for storing the detected code symbols (column 21, lines 34 to 45: Figure 11).

Regarding claims 12, 15 and 18, *Jensen et al. ('490)* discloses that the system may be enclosed in a housing 382 which is sufficiently small in size to be carried on the person of an audience member participating in an audience estimate survey (column 27, lines 34 to 48; column 28, lines 6 to 13: Figure 17).

Response to Arguments

Applicants' arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-9064. The examiner can normally be reached on 9:30 AM to 6:00 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

ML

Marsha D Banks-Harold
MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

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May 1, 2003